QUALITY CONTROL REPORTS FOR

SEMI DENSE BITUMINOUS CONCRETE

CIVIL-TECH CONSULTANTS AND ENGINEERS

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Job No.: CTCE/BBMP/W.No07/RSCN/SDBC(QB)/2014-15

17.06.2014

TEST REPORT ON DETERMINATION OF BITUMEN CHARACTERISTICS

CLIENT	:	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
AGENCY	:	**Mr. Ramsingh Chandra Naik,** Contractor, Bangalore.
NAME OF THE WORK	:	Improvements to Roads, Drains and Asphalting to roads in Venkategowda Layout Kempapura 2nd Main in Ward No.07, Byatarayanapura, BBMP, Bangalore.
REFERENCE	:	EE/BTP/BBMP-E-TND/158/2013-14 Dated: 09.10.2013
SOURCE OF LOCATION	:	Hot mix Plant, Bangalore
DATE OF TESTING	:	17.06.2014

The results of the tests conducted on the bitumen sample.

Sl. No	Description	Test Method as per IS	Test Result	Requirement as per IS:73:2013
1	Penetration at 25 ^{0}C, 1/10 mm	IS :1203 -1978 (RA-2009)	88	80 to 100
2	Softening point, ^{0}C	IS :1205 -1978 (RA-2009)	43	Min. 40
3	Ductility at 27^{0}C, cm	IS :1208 -1978 (RA-2009)	100 >	Min. 75
4	Flash Point, ^{0}C	IS :1209 -1978 (RA-2009)	294	Min. 220

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17.06.2014

Aggregate Impact Value

IS: 2386 Part IV

Client	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	**Mr. Ramsingh Chandra Naik,** Contractor, Bangalore.
Name of the Work	Improvements to Roads, Drains and Asphalting to roads in Venkategowda Layout Kempapura 2nd Main in Ward No.07, Byatarayanapura, BBMP, Bangalore.
Reference	EE/BTP/BBMP-E-TND/158/2013-14 Dated: 09.10.2013
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	17.06.2014

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	380	381	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	79	80	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	301	301	
4	Aggregate Impact value = percent fines 100* (W_2/W_1)%	20.79	21.00	**20.89**

Comments:

→ Maximum allowable Aggregate Impact value for Semi Dense Bituminous Concrete is 27%

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17.06.2014

Aggregate Impact Value

IS: 2386 Part IV

Client	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	**Mr. Ramsingh Chandra Naik,** Contractor, Bangalore.
Name of the Work	Improvements to Roads, Drains and Asphalting to roads in Venkategowda Layout Kempapura 2nd Main in Ward No.07, Byatarayanapura, BBMP, Bangalore.
Reference	EE/BTP/BBMP-E-TND/158/2013-14 Dated: 09.10.2013
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	17.06.2014

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	386	387	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	84	85	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	302	302	
4	Aggregate Impact value = percent fines 100* (W_2/W_1)%	21.76	21.96	**21.86**

Comments:

→ Maximum allowable Aggregate Impact value for Semi Dense Bituminous Concrete is 27%

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Job No.: CTCE/BBMP/W.No07/RSCN/SDBC/Shape_T/2014-15 : 17.06.2014

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	: **Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	: **Mr. Ramsingh Chandra Naik,** Contractor, Bangalore.
Name of Work	: Improvements to Roads, Drains and Asphalting to roads in Venkategowda Layout Kempapura 2nd Main in Ward No.07, Byatarayanapura, BBMP, Bangalore.
Reference	: EE/BTP/BBMP-E-TND/158/2013-14 Dated: 09.10.2013
Technical Reference	: IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	: Semi Dense Bituminous Concrete
Date of Testing	: 17.06.2014

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Result : Flakiness Index = **11.23%**

Elongation Index = **13.25%**

Result : Combined Flakiness & Elongation index **24.48%**

Comments:

Maximum allowable Flakiness & Elongation Index for Semi Dense Bituminous Concrete is 30%

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Job No.: CTCE/BBMP/W.No07/RSCN/SDBC/Shape_T/2014-15 : 17.06.2014

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	: **Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	: **Mr. Ramsingh Chandra Naik,** Contractor, Bangalore.
Name of Work	: Improvements to Roads, Drains and Asphalting to roads in Venkategowda Layout Kempapura 2nd Main in Ward No.07, Byatarayanapura, BBMP, Bangalore.
Reference	: EE/BTP/BBMP-E-TND/158/2013-14 Dated: 09.10.2013
Technical Reference	: IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	: Semi Dense Bituminous Concrete
Date of Testing	: 17.06.2014

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Result : Flakiness Index = **11.85%**

Elongation Index = **13.25%**

Result : Combined Flakiness & Elongation index **25.10%**

Comments:

Maximum allowable Flakiness & Elongation Index for Semi Dense Bituminous Concrete is 30%

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Job No.: CTCE/BBMP/W.No07/RSCN/SDBC/Stripping/2014-15 · 19.06.2014

Stripping Value of Road Aggregates (Static Immersion Test)

IS: 6241

Client	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	**Mr. Ramsingh Chandra Naik,** Contractor, Bangalore.
Name of the work	Improvements to Roads, Drains and Asphalting to roads in Venkategowda Layout Kempapura 2nd Main in Ward No.07, Byatarayanapura, BBMP, Bangalore.
Reference	EE/BTP/BBMP-E-TND/158/2013-14 Dated: 09.10.2013
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	19.06.2014

Type of binder : 80/100
Percentage of binder used : 5.0% by wt.
Total weight of aggregate : 200 g
Total weight of binder : 10.0 g
Temperature of water-bath : 40° C

Observation Number	Stripping, Percentage	Average, Percentage	Average Retained Coating, %
1	3.1	3.20	96.80
2	3.2		
3	3.3		

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Comments:

→ Minimum allowable Aggregate retained coating for Semi Dense Bituminous Concrete is 95%

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Job No.: CTCE/BBMP/W.No07/RSCN/SDBC/Sp_Wa/2014-15

19.06.2014

Specific Gravity And Water Absorption Test

IS: 2386 Part III

Client	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	**Mr. Ramsingh Chandra Naik,** Contractor, Bangalore.
Name of the Work	Improvements to Roads, Drains and Asphalting to roads in Venkategowda Layout Kempapura 2nd Main in Ward No.07, Byatarayanapura, BBMP, Bangalore.
Reference	EE/BTP/BBMP-E-TND/158/2013-14 Dated: 09.10.2013
Type of Mix	Semi Dense Bituminous Concrete
Source / Location	Hotmix Plant, Bangalore
Date of Testing	19.06.2014

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2024	2025	2021	
2	Weight of basket suspended in water	W_2 g	755	2020	755	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1269	1270	1266	
4	Weight of saturated surface dry aggregate in air	W_3 g	2016	2018	2020	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_S)$ g	747	748	754	
6	Weight of oven dried aggregate	W_4 g	1999	2002	2012	
7	Specific Gravity	$W_4/(W_3-W_S)$	2.676	2.676	2.668	2.674
8	Apparent Specific gravity	$W_4/(W_4-W_S)$	2.738	2.735	2.697	2.723
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.85%	0.80%	0.40%	0.68%

Comments:

→ Maximum allowable Aggregate Water absorption value for Semi Dense Bituminous Concrete is 2.0%

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19.06.2014

BITUMEN CONTENT DETERMINATION OF SEMI DENSE BITUMINOUS CONCRETE MIX

AS per IRC:SP:-1984

CLIENT	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
AGENCY	**Mr. Ramsingh Chandra Naik,** Contractor, Bangalore.
NAME OF THE WORK	Improvements to Roads, Drains and Asphalting to roads in Venkategowda Layout Kempapura 2nd Main in Ward No.07, Byatarayanapura, BBMP, Bangalore.
REFERENCE	EE/BTP/BBMP-E-TND/158/2013-14 Dated: 09.10.2013
SAMPLE I/D	Roads in Venkategowda Layout in Ward No.07.
DATE OF TESTING	19.06.2014

BITUMEN CONTENT DETERMINATION

Description	Trail 1	Trail 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	474.5	474
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	25.5	26.00
7. Bitumen content in %	5.10	5.20
8. Average	**5.15**	

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Job No.: CTCE/BBMP/W.No07/RSCN/SDBC/Bit/2014-15 19.06.2014

BITUMEN CONTENT GRADATION DETERMINATION OF SEMI DENSE BITUMINOUS CONCRETE MIX

As per IS2386 and IRC:SP:11-1984

CLIENT	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
AGENCY	**Mr. Ramsingh Chandra Naik,** Contractor, Bangalore.
NAME OF THE WORK	Improvements to Roads, Drains and Asphalting to roads in Venkategowda Layout Kempapura 2nd Main in Ward No.07, Byatarayanapura, BBMP, Bangalore.
REFERENCE	EE/BTP/BBMP-E-TND/158/2013-14 Dated: 09.10.2013
SAMPLE I/D	Roads in Venkategowda Layout in Ward No.07.
DATE OF TESTING	19.06.2014

GRADATION AFTER EXTRACTION

Sieve Size in mm	Trail 1				Specified Limits as per MORTH specification table 500-15 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
13.2	0	0	0	100	100
9.5	26.35	5.55	5.55	94.45	90-100
4.75	259.6	54.71	60.26	39.74	35-51
2.36	56.32	11.87	72.13	27.87	24-39
1.18	41.22	8.69	80.82	19.18	15-30
0.3	33.25	7.01	87.83	12.17	9-19
0.075	32.65	6.88	94.71	5.29	3-8

Sieve Size in mm	Trail 2				Specified Limits as per MORTH specification table 500-15 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
13.2	0	0	0	100	100
9.5	30.25	6.38	6.38	93.62	90-100
4.75	259.6	54.77	61.15	38.85	35-51
2.36	60.32	12.73	73.88	26.12	24-39
1.18	35.62	7.51	81.39	18.61	15-30
0.3	33.25	7.01	88.41	11.59	9-19
0.075	26.32	5.55	93.96	6.04	3-8

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Job No.: CTCE/BBMP/W.No07/RSCN/SDBC/AGG/2014-15 · 19.06.2014

Aggregate Gradation Test

IS : 2386 Part I

Client	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	**Mr. Ramsingh Chandra Naik,** Contractor, Bangalore.
Name of the Work	Improvements to Roads, Drains and Asphalting to roads in Venkategowda Layout Kempapura 2nd Main in Ward No.07, Byatarayanapura, BBMP, Bangalore.
Reference	EE/BTP/BBMP-E-TND/158/2013-14 Dated: 09.10.2013
Sample I / D	Hot Mix Plant, Bangalore
Type of Mix	Semi Dense Bituminous Concrete (SDBC)
Date of Testing	19.06.2014

Total Weight of Sample: **5250** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Grade-II As per MORTH	Remarks
13.2	0	0.0	0	100	100	Gradation satisfies Grade-II MORTH specification
9.5	365	7.0	6.95	93.05	90-100	
4.75	2685	51.1	58.10	41.90	35-51	
2.36	630	12.0	70.10	29.90	24-39	
1.18	490	9.3	79.43	20.57	15-30	
0.3	355	6.8	86.19	13.81	9-19	
0.075	385	7.3	93.52	6.48	3-8	

Total Weight of Sample: **5350** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Grade-II As per MORTH	Remarks
13.2	0	0.0	0	100	100	Gradation satisfies Grade-II MORTH specification
9.5	350	6.5	6.54	93.46	90-100	
4.75	2550	47.7	54.21	45.79	35-51	
2.36	865	16.2	70.37	29.63	24-39	
1.18	445	8.3	78.69	21.31	15-30	
0.3	385	7.2	85.89	14.11	9-19	
0.075	425	7.9	93.83	6.17	3-8	

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